THE INSTITUTE OF PHYSICS

47 BELGRAVE SQUARE, LONDON, S.W.1

BULLETIN

No. 24 *Information in this circular is not intended for general publication: your copy should not therefore be passed to a library.* DECEMBER 1951

NOTICES TO MEMBERS

Physicists visiting the United States of America

The Institute's help has recently been sought in expediting decisions upon applications from Members for visas to enter the United States. The Science Attaché of the United States Embassy in London states that applications from physicists and others who have been engaged in work on radio-isotopes, even if such work has not been specifically directed towards problems connected with atomic energy, should be filed as far in advance as possible, as action in such cases may, under present conditions, require as much as three months for completion. It is understood that all such applications must be decided in Washington. Members who may be concerned are advised to apply, if possible, even more than three months ahead.

Regulations for Associateship

From time to time the Membership Committee has found difficulty in interpreting the regulations governing election to Associateship so as to reach a just decision upon applications from candidates having adequate professional experience but holding a degree in a science other than physics. The Board has approved a recommendation from the Committee that the following statement be included in the next edition of the published regulations as an additional intepretation of the relevant By-Laws.

"In exceptional circumstances, the Institute is prepared to consider the acceptance of qualifications in subjects other than physics as evidence of the academic standard demanded for Associateship, provided that the holders of such qualifications can satisfy the Board concerning their training in physics. Candidates must also have been engaged for not less than five years in such responsible work in physics or its applications as shall satisfy the Board.

"As general guidance to intending candidates, the standard of qualification which the Board will accept in this connection is that of a first- or second-class honours degree of a British university. Those whose training in physics and mathematics is not regarded as sufficient will be asked to take such parts of the Graduateship examination as may be deemed necessary."

It is expected that the number of applicants acceptable under this interpretation will be very small. The professional experience of such candidates will be most carefully investigated.

Conference on Static Electrification

The Board has approved a proposal that the Institute shall organize a conference covering all aspects of static electricity, including its generation and removal. The conference, which will probably extend over three days, will be held in London early in 1953. An organizing committee has been set up with the following constitution. Dr. S. Whitehead (Chairman), Dr. J. S. Forrest, Dr. A. J. Maddock, Dr. P. S. H. Henry, Dr. H. G. Lubszynski, Dr. H. O. Puls, Dr. J. Walker, and Dr. T. B. Rymer. Further details will be announced in due course.

Third International Spectroscopy Colloquium

The Industrial Spectroscopy Group of the Institute is organizing the Third International Spectroscopy Colloquium which is to be held in this country on September 1–3, 1952. Mr. E. Van Someren is Conference Secretary. Full details will be announced shortly.

Graduateship Examination

The Graduateship Examination will be held in June 1952. Registration forms for admission to the examination are available from the Deputy Secretary and should be completed and returned by the end of December. Full details and syllabuses of the examination will gladly be supplied (gratis) on request.

Proceedings of Discussion on Heat Transfer

The Proceedings of the Conference on Heat Transfer held in London in September 1951 and organized by the Institution of Mechanical Engineers are expected to be published early in 1952. The bound volume will include the ninety-three papers and discussion of the London conference and also the discussion of the similar conference held in November at Atlantic City, U.S.A. Members of the Institute may obtain copies at £2 5s. each, provided that orders and remittances are received by the Secretary before December 28th.

Change of Branch and Group Officers

Midland Branch—Dr. T. L. Ibbs (Fellow) has succeeded Dr. D. Parkinson (Fellow) as Chairman.

Industrial Spectroscopy Group—Mr. J. R. Stansfield (Associate) has succeeded Mr. K. Dixon as Honorary Secretary.

New Members of the Board

Because of pressure of work, Dr. F. P. Bowden has resigned his seat on the Board. Mr. R. G. Wood (Fellow) has been elected to fill the vacancy until 30th September, 1952.

Mr. F. I. G. Rawlins (Fellow) has succeeded Professor H. W. Thompson as the representative of the Faraday Society; Dr. L. H. Clark (Fellow) has replaced Mr. W. A. Langmead as the representative of the British Institute of Radiology.

Members' Personal Copies of Publications

Members are reminded that the concession through which they are enabled to obtain journals free as part of their subscription or at nominal rates is a strictly personal privilege of membership and that journals so obtained should be for the personal use of members. Occasionally, because of misunderstanding, firms order Institute publications for their libraries at the special members' rate in the names of members of the Institute who are on their staff.

The Institute relies upon the large sales of its publications at the full retail price to meet the printing and overhead expenses of publishing, to which, of course, members contribute by their subscriptions to the Institute.

New Advanced Course

The Institute has been notified of two new advanced lecture courses at the West Ham Municipal College. One is on "Differential Equations and Boundary Value Problems" and the other "Numerical Applications of the Finite Difference Calculus." Each course will be held on Wednesday evenings for twenty weeks beginning January 9, 1952. Details may be obtained from the Principal of the College.

Joint Commission on Electron Microscopy

The Executive Board of the International Council of Scientific Unions, at a recent meeting in Washington, approved a proposal to establish a Joint Commission on Electron Microscopy, with the International Union of Pure and Applied Physics as parent union. A leading part in the establishment of the Joint Commission has been taken by the Institute's Electron Microscopy Group.

Change of Address

The Technical and Scientific Register of the Ministry of Labour and National Service, formerly at York House, Kingsway, is now at the following address:

Almack House,
26–28 King Street,
St. James's Square,
London, S.W.1.

The telephone number is TRAfalgar 7020.

Choice of Journals for 1952

Fellows and Associates who may wish to alter their instructions about Institute journals are asked to do so before the end of 1951. As wrappers for the despatch of journals have to be prepared by the Institute's staff some time before publication date, changes notified after December 24th. 1951 cannot be effected in time for the January 1952 issue.

A similar request is made to those members of other grades whose subscriptions are paid by bankers' orders and whose orders for journals are therefore continued automatically. Members of these grades who pay by cheque should renew their orders when sending their subscriptions as copies are sent when their remittances are received.

PROCEEDINGS OF THE BOARD

The Board met on 17 May, 19 July and 11 October, the President (Professor W. E. Curtis) in the Chair. In addition to formal business and matters already referred to in the Bulletin, the following items were dealt with:

Income Tax on Publications

It was reported that the Inland Revenue authorities had now given a ruling exempting the Institute's publications from income tax, to which they had been subject since the founding of the *Journal of Scientific Instruments* nearly thirty years ago. The authorities had also accepted a claim by the Institute for the repayment of tax recently paid.

Price of Journals in 1952

The Board approved a recommendation of the Finance Committee that the retail price (i.e. to non-members) of the annual volume of each journal in 1952 be increased from £3 to £4 in view of the increased cost of printing, paper and despatch, estimated to amount to between 25 and 35% next year.

Training Course for Radiologists

Following proposals made by the Committee of the Industrial Radiology Group, the Board has recommended to the City and Guilds of London Institute that it should consider the desirability of setting up an Exploratory Committee to investigate the need for courses and examinations in industrial radiography. The City and Guilds of London Institute has agreed to this recommendation and a committee will shortly be constituted.

M.K.S. System of Units

The Board had previously referred to its Education Committee a request from a Member that the Institute should give some guidance to teachers of physics upon the extent to which the M.K.S. system of units should be used. The Education Committee reported as follows:

"We do not consider that, at the present stage, it would be appropriate for the Board to attempt to give a definite lead to teachers on this question. We are, however, satisfied that there are weighty considerations

in favour of the rationalized M.K.S. system of electrical units and we believe the Board might well take steps to draw the attention of teachers of physics to the need for consideration of this matter. The advantages of the proposed system are, in our opinion, sufficient to justify more formal consideration by a committee composed of representatives of the Institute and, say, the Physical Society and the Science Masters' Association."

Steps have been taken to have such a committee set up.

In reply to subsequent correspondence with the Science Masters' Association, the Board has expressed its strong support of the Association's suggestion that examination papers at matriculation level should contain questions that can be answered by those trained on rationalized M.K.S. lines as alternatives to questions that require a knowledge of c.g.s. electromagnetic and electrostatic units.

Royal Society Grant

It was reported that the Royal Society had made a grant of £500 to the Institute from the Parliamentary Scientific Publications Grant-in-Aid.

Salary Statistics

It was reported that a large number of requests had been received from employers and others for additional copies of the report on the salary inquiry and that it was understood that the data had been of considerable assistance in determining revision of salaries where these had been under consideration.

Board Members Visits Abroad

Dr. H. L. Penman, who is visiting Australia for six months as a visiting lecturer in the University of Adelaide and elsewhere, was asked to convey the Board's good wishes to the Australian Branch.

Mr. E. W. H. Selwyn was asked to convey the Institute's good wishes to The American Institute of Physics when he attended its Convention in Chicago.

Representatives on other Bodies

Invitations were received from the Yorkshire Council for Further Education to nominate representatives on two Advisory Committees on Applied Physics. The following Members were asked to serve and have accepted:

Commitee for South and East Yorkshire—Mr. D. A. Oliver, Dr. K. W. Andrews and Dr. J. Topping.

Commitee for North Yorkshire—Professor E. G. Cox, Dr. M. O. Pelton and Dr. D. L. Smare.

NEW BOOKS

Cancer: Where We Stand. By S. Russ, C.B.E., D.Sc., F.Inst.P. (London: Oxford University Press, Geoffrey Cumberlege). Pp. xv + 192 with 15 plates. Price 10s. 6d.

To write a book for laymen on the subject of cancer is a difficult task, as the author must steer a course between sensational optimism on the one hand and fear-augmenting pessimism on the other. At the same time he must be interesting and informative without being too technical or abstruse. In this Professor Russ is very largely successful and has given us a valuable little book which deserves to be widely read. The subjects it deals with include the nature of cancer; theories of its origin; its prevalence; its diagnosis; the development of surgical methods of dealing with it; X-ray, radium and chemical methods of treatment, and the results of treatment. Being a physicist, Professor Russ naturally dwells at length on the physical aspects of the subject, and yet, unexpectedly, this is the less satisfactory part of the book, being rather too long and delving rather too much into history. Though it makes interesting reading, the layman might find information about the possible roles of radioactive isotopes and neutrons (which surprisingly hardly receive a mention) more rewarding. The chapter on the results of treatments would be improved by editing the tables, which might be confusing to the layman, and the laying of greater emphasis on some of the conclusions to be drawn. Nevertheless, these are minor blemishes on a book which faces and describes the facts clearly and interestingly, which will be strongly supported by medical men for its insistence on the importance of early diagnosis, and which can unreservedly be recommended to any interested layman.

W. J. Meredith

Josiah Willard Gibbs: The History of a Great Mind. By Lynde Phelps Wheeler. (Yale University Press. London: Geoffrey Cumberlege.) Pp. xi + 264. Price $4.00.

Many people think that Willard Gibbs was the greatest scientist the United States has ever produced and he has even been called "the greatest scientific philosopher since Newton," yet Gibbs the man has remained relatively unknown. The work under review, which incorporates a good deal of new material, was written by one of Gibbs' pupils at the request of members of Gibbs' family and others with the dual aim of presenting an authoritative personal biography and of illustrating the application of Gibbs' work to the subsequent development of the physical sciences. Mr. Wheeler found that it was almost impossible to separate these two themes because "to an unusual degree Gibbs' scientific work *was* Gibbs," so that the use of the word "mind" rather than "man" in the sub-title is entirely accurate. The book shows us enough of the human side of Gibbs, however, to give a picture of an attractive and happy personality, the outstanding qualities of which were modesty, certainty of purpose and, above all, serenity. While scientific work of such originality, fundamental importance and comprehensiveness could only have been produced by an intellect of exceptional power, the remarkable completeness and perfection of Gibbs' work is very much in keeping with his character as portrayed in this book; he was evidently accurate in the assessment of his own talents, clear-sighted in his aims, entirely satisfied in achievement and without wish for any external recognition of it. His personal qualities must have impressed his contemporaries at Yale quite early, for his appointment as professor of theoretical physics was made when his sole published work

was a specification for a railway-coach brake. It is true that this appointment was honorary, and it was not until ten years later that Yale was stirred into offering him a salary. In the meanwhile Gibbs had published the three famous papers in the *Proceedings of the Connecticut Academy*, laying the foundations of chemical thermodynamics so thoroughly and completely that they have survived all the scientific upheavals of the present century and still continue to provide the basis for important new developments. This work and Gibbs' later great contributions in the fields of vector analysis and statistical mechanics are well described in Mr. Wheeler's book, although less is said about subsequent developments than might have been expected from the remarks in the preface; in a book of this modest size, however, so large a topic could scarcely have been dealt with extensively.

Most harassed mid-twentieth century scientists will read with envy passages in the book describing the outwardly eventless life of Gibbs, and some perhaps may think that in the calm of nineteenth-century Connecticut it was easier to have the simple contemplative serene nature which Mr. Wheeler suggests was the only soil from which such profound work as his could spring. But correspondence of other scientists which is quoted shows that apologies for delays in answering letters owing to pressure of work are not exclusively a phenomenon of the atomic age, and we may guess that then as now some people, including Gibbs, were better than others at organizing their lives. It is, however, comforting to find that even Gibbs showed some human failings as when he confessed that he had never had the perseverance to get through Grassmann's *Ausdehnungslehre*, and in one apparently unique instance (in a letter to *Nature*) allowed an error to slip into his published work.

The author tells us that this book has been a labour of love, which has given him very great satisfaction to write. He has found it necessary in order to do justice to his subject to describe the main features of Gibbs' work in scientific terms and it is therefore not armchair reading for non-scientists, but there will be few physicists and chemists who will not find this book extremely interesting and very stimulating.

E. G. Cox

MEMBERS OF NOTE

Thomas Leonard Ibbs, M.C., D.Sc. (*Chairman, Midland Branch*). Dr. Ibbs, who is now 62 years of age, has been connected for most of his life with the University of Birmingham, graduating in physics in 1910 after studying under Professor Poynting. For four years he was a schoolmaster and then served with distinction as an officer in the Monmouthshire Regiment. He saw nearly four years' active service in France, was awarded the Military Cross and bar and was mentioned in despatches.

At the end of the war, Dr. Ibbs joined the physics staff of the University of Birmingham; for his researches on thermal diffusion he was awarded the Ph.D. in 1925 and D.Sc. in 1932. He is now Senior Lecturer in Physics and Admissions Tutor of the Faculty of Science and serves the University and the student body in a wide range of administrative and advisory posts, including Chairmanship of the University Joint Recruiting Board and Presidency of the Athletic Union. For some years he has been a member of the University Council and a representative of the University on the Joint Matriculation Board. Dr. Ibbs has always shown a close interest in the work and problems of teachers of physics in schools.

Elected to Fellowship of the Institute in 1936, Dr. Ibbs has been one of its most active members ever since. Closely connected with the Midland Branch since its foundation, he was its Honorary Secretary from 1938 until 1943. After serving as Vice-Chairman, he succeeded Dr. D. Parkinson as Branch Chairman, with a seat on the Board, in October of this year. Dr. Ibbs had served as an Ordinary Member of the Board from 1947 until September 1951. In 1937 he was Honorary Secretary of the Institute's second "Physics in Industry" conference which was held in Birmingham.

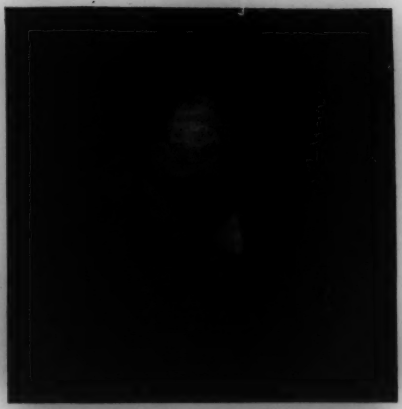
In the last four years Dr. Ibbs has been a member of the Membership Committee and his advice was most valuable in the discussions on changes in the regulations. He has now been appointed Chairman of the Education Committee of the Board.

Francis Ian Gregory Rawlins, M.Sc., F.R.S.E. (*Member of the Board*). Born in 1895, Mr. Rawlins was educated privately and at Trinity College, Cambridge and the University of Marburg. He was awarded the M.Sc. degree of Cambridge in 1926 for a thesis on the infra-red spectra of crystals, and from 1931–34 was Director of Science Studies, Fitzwilliam House, Cambridge. In 1934 he was appointed to the newly created post of Scientific

Adviser to the National Gallery, London, which he still holds. Mr. Rawlins is one of the world's leading authorities on the application of science to the delicate problems arising in the preservation and structural determination of priceless art treasures. In 1937 he was elected a Fellow of the Royal Society of Edinburgh.

Well known to American art authorities, Mr. Rawlins was Robert Trowbridge Memorial Lecturer at the University of Yale in 1939 and Fenton Lecturer (on "The Philosophy of the Arts and Sciences") at the University of Buffalo in 1947. In both years he conducted courses and demonstrations on the application of scientific methods to the fine arts, at the Fogg Art Museum, University of Harvard.

When the International Institute for the Conservation of Museum Objects was founded in 1950, Mr. Rawlins was elected its sole Vice-President and is its Honorary Secretary-General. He is also editing its publication *Studies in Conservation*. His own publications include numerous articles in *Technical Studies in the Field of Fine Arts* and he is known to many for his regular reviews of philosophical works in *Nature* and other journals.



Mr. Rawlins was elected to Associateship of the Institute in 1927 and to Fellowship in 1929. He has served on the Board as the representative of the Faraday Society for two periods, 1932–36 and 1944–48 and has now been appointed by the Society again. A member of the Finance Committee and Membership Committee for several years, he also gave most valuable service as first chairman of the House Committee. The Institute is indebted to him for his expert guidance in the equipping and furnishing of its House.

NATIONAL CERTIFICATES IN APPLIED PHYSICS

The number of candidates taking final examinations for Ordinary and Higher National Certificates in Applied Physics is increasing most satisfactorily. In 1951, in England and Wales, 107 entered for the Ordinary Certificate and 29 for the Higher; last year the number of Ordinary candidates was 64 and there were only six candidates for the Higher Certificate, the examination for which was held for the first time. Four candidates in Scotland took the Ordinary Certificate examination. In England and Wales the Institute's assessors were the following three Fellows—Mr. G. R. Noakes (physics), Dr. J. Topping (mathematics), and Mr. G. W. Warren (applied physics), as last year; in Scotland Mr. L. W. Magson (Associate) was assessor for all three subjects.

Below are given a summary of the results and the names of the successful candidates with the colleges at which they studied. Candidates who have passed the Ordinary examination but have not fully complied with other requirements (length of course, for example), are not entitled to Certificates but may begin the course for the Higher Certificate.

	Colleges	*Candidates*	*Certificates*	*Passes without Certificates*	*Fail.*
England and Wales					
Ordinary	11	107	57	6	44
Higher	5	29	23	–	6
Scotland					
Ordinary	1	4	2	–	2

England and Wales

Higher National Certificates in Applied Physics

College of Technology, Liverpool

N. Lanigan. M. Longden.

South-East London Technical College, Lewisham

D. W. Berry.
S. H. Cross (*Distinction in Physics*).
D. R. G. Ford (*Distinction in Mathematics*).
D. G. H. Jones (*Distinction in Applied Physics*).
D. Letts.
N. A. Mackechnie.

Northampton Polytechnic, London

G. H. Byford.
R. Elam.
A. G. Ellis.
J. V. Harding.
F. C. Loveless.
R. C. Newman.
J. G. Padbury.

Rotherham Technical College

E. L. N. Jackson. D. L. Mawson.

Royal Technical College, Salford

G. V. Bond (*Distinction in Mathematics*).
J. G. Butlin (*Distinction in Mathematics*).
D. Hatch.
R. Sykes.
P. Wiles.
A. E. Williams.

Ordinary National Certificates in Applied Physics

Acton Technical College

P. K. Doran.
R. F. Everett.
D. F. Hill.
R. E. Nicholls.
D. Wilde.

College of Technology, Birmingham

A. L. Baker.
R. Chittleburgh.
W. L. Gregory.
T. R. Hampton.
R. G. Patton.
T. Plant.
J. Turley.
R. M. Wood.

South-East Essex Technical College, Dagenham

J. D. Pratt. A. Thomas.

College of Technology, Liverpool.

J. C. Bold. L. D. Livingston.
I. H. Bullock. J. F. Matthews.
J. Ellwood. A. Thomson.

South-East London Technical College, Lewisham

D. E. Banks. B. A. Mills.
D. M. Barton. D. A. Moore.
J. H. Blackford. P. F. Probert.
V. F. Branch. T. I. Putner.
C. D. Broughton. D. V. Ranson.
T. A. Kebbell. D. G. Wenham.

Northampton Polytechnic, London

J. Black. J. F. Hall.
P. J. Carr. R. S. Knight.
J. P. Dowdall. M. R. Ward.

Schools of Technology, Art and Commerce, Oxford

R. M. Absalom. H. G. May.
D. F. Dance. G. J. Oswell.
R. W. Henson.

Harris Institute, Preston

T. H. Cowperthwaite.

Reading Technical College

W. W. Evans. A. C. Heath.
D. B. Gasson. S. J. Moodie.
M. E. Harper.

Rotherham Technical College

S. R. Howarth. R. Scholes.
B. Howell. D. A. Windle.

Royal Technical College, Salford

R. E. Bradford. D. D. Mold.
D. Clift.

SCOTLAND

Ordinary National Certificates in Applied Physics

Paisley Technical College

A. H. Stewart. A. M. Taylor (*Distinction in Applied Physics*).

Note.—The rules approved by the two Joint Committees of the Institute and the Ministry of Education and the Institute and the Scottish Education Department differ slightly. In England and Wales no distinction mark is awardable at the Ordinary stage, but in Scotland distinction may be awarded at either the Ordinary or Higher examination.

THE REGISTER

ELECTIONS TO MEMBERSHIP

An asterisk (*) indicates transfer from another grade.

Fellow

*Simmonds, William Arthur, B.Sc., Senior Physicist, Gas Research Board, Beckenham, Kent.

Associates

Ainsworth, Leslie, B.Sc., Assistant Lecturer and Research Assistant, University of Sheffield.
Armitage, Maurice Darley, B.Sc., Assistant Lecturer, South-East Essex Technical College, Dagenham.
Cahn, Robert Wolfgang, B.A., Ph.D., Lecturer, Department of Metallurgy, University of Birmingham.
*Cooper, Herbert, B.Sc., Physicist, Chance Brothers Ltd., Birmingham.
Drake-Seager, Edmund Richard, B.Sc., Scientific Officer, Army Operational Research Group, London.
Glen Earl, Francis John, B.Sc., Lecturer in Physics, Rugby College of Technology and Art.
*Goss, Alan Jerome, B.Sc., Research Student, University College, Southampton.
Watson, Peter Ewart, B.A., Assistant Research Manager, National Titanium Pigments Ltd., Luton, Bedfordshire.

Graduates

*Byford, Gordon Holt, Electro-acoustic Engineer, Otological Research Unit, Medical Research Council.
Byrom, Neville Taylor, B.Sc., Research Student, University of Reading.
Dyson, John Edmund, B.Sc., Assistant Lecturer in Physics, Huddersfield Technical College.
*Elam, Ronald, Technical Assistant, Hilger and Watts Ltd., London.
*Ellington, Kenneth Leopold, B.Sc., Assistant Engineer, Telecommunications Laboratories Ltd., Enfield.
*Ellis, Jonas, B.Sc., Research Student, University College, London.
*Hardy, John Edward, B.Sc., Assistant Physicist, British Oxygen Co. Ltd., London.
Harland, Colin Wood, B.Sc., Assistant Lecturer, South-East London Technical College.
Haly, Alan Robert, B.Sc., Technical Officer, Wool Textile Research Laboratory, Commonwealth Scientific Industrial Research Organization, Australia.
Herbert, Frederick Maitland, B.Sc., Area Manager, War Department.
*Loveless, Frederick Charles, Technical Assistant, Hilger and Watts Ltd., London.
Newman, Ronald Cyril, Instrument Maintenance Assistant, Eastern Gas Board, London.
*Padbury, John Gibson, Senior Technician, Instrument Division, National Institute for Medical Research, London.
Pratt, Ronald George, B.Sc., Technical Assistant, Electronics Research Laboratories, Mullard Radio Valve Company, Salford.
Pim, John Charles, M.A., Methods Engineer, The General Electric Co. Ltd, Telephone Works, Coventry.
Skinner, John George, Design Draughtsman, Hilger and Watts Ltd., London.
Swingler, Maxwell Walter, B.Sc., Technical Assistant, Mullard Radio Valve Company, Salford.
*Taylor, Endaf Davies, B.Sc., Physicist, Standard Telephones and Cables Ltd., Monmouthshire.
Wiles, Philip, Technical Assistant, British Rayon Research Association, Manchester.
Wilkinson, Kenneth Herbert, B.Sc., Physicist, Research Laboratories of the General Electric Co. Ltd., Wembley, Middlesex.
Williams, Albert Edward, Assistant Technical Officer, Imperial Chemical Industries Ltd., Manchester.

Subscriber

Gillett, Barbara Ann, Radiologist, J. Stone and Co. (Charlton) Ltd.

Students

Andrew, F. S., The Technical College, Bradford.
Assenheim, H. M., Northern Polytechnic, London.
Assenheim, J. G., Northern Polytechnic, London.
Baines, R. E. R., The Polytechnic, Regent Street, London.
Brimfield, E. G., University College of Swansea.
Bulmer-Bird, F. G., University College of Swansea.
Carter, G. H., The Technical College, Bradford.
Clough, I. D., The Technical College, Bradford.
Courtenay, H. D., Birkbeck College, London.
Courtenay, V. D., Birkbeck College, London.
Coveney, W. E. F., The Polytechnic, Regent Street, London.
Crook, C. E., The Technical College, Brighton.
Davies, H. G., University College of Swansea.
Davies, T. A., University College of Swansea.
Davis, D. G., University College, London.
Dennis, J. A., Imperial College of Science and Technology, London.
Dixon, N. E., Imperial College of Science and Technology, London.
Dunlop, B. R., University of Western Australia.
Edwards, W. T., The Polytechnic, Regent Street, London.
Evans, R. D., Glamorgan Technical College, Treforest.
Fursey, R. A. E., Acton Technical College.
Greenhouse, K. G., Loughborough College.

Grieve, D. W., Woolwich Polytechnic, London.
Gross, M. J., The Polytechnic, Regent Street, London.
Hammett, J. D. H., University of Manchester.
Jaffrey, W. G., The Polytechnic, Regent Street, London.
James, R., University College of Swansea.
Jones, J. C., University College of Swansea.
Kehoe, R. B., Imperial College of Science and Technology, London.
Keller, D. J., The Polytechnic, Regent Street, London.
King, J. C., Imperial College of Science and Technology, London.
Lancaster, J. A., Mid-Essex Technical College, Chelmsford.
Longman, T. R. M., University of Bristol.
Lucken, J. A., King's College, London.
Matthews, A. R., University of Bristol.
Michaelson-Yeates, P. G., Royal Technical College, Salford.
Miles, R., Glamorgan Technical College, Treforest.
Murdin, M. R., Battersea Polytechnic, London.
Murrell, S. A. F., Trinity College, Cambridge.
Newman, R. C., Imperial College of Science and Technology, London.
Nicholls, S., University College of Swansea.
Osborne, D. G., University of Durham.
Oteng, R., Chelsea Polytechnic, London.
Partridge, A. T., Imperial College of Science and Technology, London.
Rainford, F., University College of Swansea.
Rosenbaum, S. D., Imperial College of Science and Technology, London.
Saunders, R. A., Woolwich Polytechnic, London.
Sekyim-Kwandoh, A. K., Chelsea Polytechnic, London.
Strong, R. W., University College of Swansea.
Summerton, M. E., University College of Swansea.
Thomas, G. M., University College of Swansea.
Tibbetts, D. R., Imperial College of Science and Technology, London.
Turner, W. G., Glamorgan Technical College, Treforest.
Walker, D., The Technical College, Bradford.

APPOINTMENTS VACANT

The inclusion of particulars of a vacancy must not be taken to imply that the Institute necessarily approves of the terms offered or that might be offered. Candidates should satisfy themselves that these are satisfactory, and they may always refer to the Institute for advice.

Physicist or **Engineer** with knowledge of electronic and ionic measuring devices required by **Electrical Research Association** for developments in wind power generation. Starting salary £500–£750 per annum according to experience. Reply to: Director, Electrical Research Association Laboratory, 5 Wadsworth Road, Perivale, Greenford, Middlesex.

National Coal Board. Applications are invited for the undermentioned superannuable appointments at the Central Research Establishment, Stoke Orchard, Nr. Cheltenham.

(1) **Scientists** II or III for research in the telecommunications and light electrical engineering fields. Candidates should have an honours degree in electrical engineering or physics, with good knowledge of electronic techniques.

Appointment will be as Scientist grade III on the scale £445 × £25 to £845 per annum, or Scientist grade II on the scale £645 × £30 to £995 per annum, according to ability and experience. At least three years research experience is essential for appointments as grade II. Reference TT/400.

(2) **Electronic Engineers** to design and construct electronic devices for research.

Appointment will be as Scientific Technologist grade I on the scale £435 × £20 to £655, or Senior Scientific Technologist on the scale £670 × £25 to £820. Good experience and knowledge of circuitry is essential for appointment as Senior Scientific Technologist. Reference TT/401.

Apply in writing, giving full particulars (in chronological order) of age, education, qualifications and experience (with dates) to National Coal Board, Establishments (Personnel), Hobard House, Grosvenor Place, London, S.W.1, marking envelope with the relevant TT reference number quoted above. Original testimonials should NOT be forwarded. Closing date January 12, 1952.

Applications are invited by the **Ministry of Supply** from **Physicists** and **Electrical Engineers** for the following posts in the Scientific Officer class at a Research Establishment South East of London.

(1) **Electrical Engineer** with a sound knowledge of physical principles and electronic applications to physics problems. Reference D490/51A.

(2) **Physicist** or **Electrical Engineer** with experience in radio communications. Reference A337/51A.

(3) **Physicist** with experience in electronic circuitry problems for measurement of high speed transients. Reference A337/51A.

(4) **Electrical Engineer** for research and development in V.H.F. and U.H.F. transmission and reception. Previous experience in leading a team of scientists in the execution of field trials would be of value. Reference D490/51A.

(5) **Electrical Engineer** for design and development work in a wide field of electronic instruments. Experience in the design of radio receivers and transmitters and/or in the handling of high speed transients would be of value. Reference D490/51A.

Candidates should possess a 1st or 2nd class honours degree in physics or electrical engineering or equivalent qualification, and for the senior posts at least three years' post-graduate research experience. For post (1) candidates should have served an apprenticeship. Salary will be determined on age, qualifications and experience within ranges £380 to £1,295. Rates for women somewhat lower. Posts are unestablished but carry benefits under F.S.S.U. Application forms obtainable from Ministry of Labour and National Service, Technical and Scientific Register (K), Almack House, 26 King Street, London, S.W.1, quoting appropriate reference number. Closing date December 29, 1951.

Part-time Physicist, graduate preferred, required to work with Obstetric and Gynaecological Surgeon at a hospital in the Croydon area on physical (primarily rheological) properties of body secretions. Salary according to qualifications. Applications stating age, qualifications and experience to Box No. A.V. 19, The Institute of Physics, 47 Belgrave Square, London, S.W.1.

Applications are invited by the Ministry of Supply for vacancies in the **Experimental Officer** Class at the **Atomic Energy Research Establishment,** Harwell, Berks, for work in the following fields:

Physics, Electronics and Scientific Computing (Reference A309/51/A/BM) and Chemistry (other than Organic Chemistry), Chemical Engineering and Metallurgy (Reference F777/51/A/BM).

These posts offer a wide variety of experimental work in connection with the development of atomic energy and the opportunity for a career in an increasingly important branch of science. Candidates should possess at least Higher School Certificate or Higher National Certificate in a relevant scientific subject or mathematics or equivalent qualification. Higher qualifications will be an advantage.

Appointments will be made according to qualifications, experience and age within the following salary ranges:—

Experimental Officer (male) £545–£695 per annum. Assistant Experimental Officer (male) £240 (at age 18)–£505 per annum. Rates for women somewhat lower.

Application forms obtainable from the Ministry of Labour and National Service, Technical and Scientific Register, Almack House, 26 King Street, London, S.W.1, quoting the appropriate reference number. Closing date December 24, 1951.

Graduate Physicist aged up to 27 required by Central Research Department of **The Morgan Crucible Company Limited.** Successful applicant will be required to work initially on development of high voltage test equipment and should have an interest in electronics and the electrical properties of matter. Position is interesting, pensionable and permanent. Write giving details of age, experience, qualifications and salary required to the Staff Manager, (UB) Battersea Church Road, S.W.11.

Crompton Parkinson Limited invite applications from **graduate physicists** with good honours degrees to work in their Lamp Development laboratory on general lamp problems. Applicants with or without experience will be considered. Good prospects for man wishing to make a career in industry. Send full particulars of training and practical experience, if any, to reference GLD, Crompton Parkinson Limited, Guiseley, Nr. Leeds, Yorkshire.

Physicists are invited by the **Ministry of Supply** to apply for posts in the Scientific Officer Class at the Radiochemical Centre, Amersham, Bucks.

Post 1.—**Principal Scientific Officer/Senior Scientific Officer** to take charge of the Physics department. This group provides all the physical services requisite to the production of radioactive isotopes and undertakes associated research and development work. Its principal activities are concerned with health physics and the absolute calibration of radiation sources and concomitant problems of instrumentation. Several years research experience in applied nuclear physics is necessary and candidates should be accustomed to organizing the work of a small department. Reference A320/51/A.

Post 2.—**Scientific Officer** for research and development work related to the production of radioactive isotopes, concerning particularly the absolute calibration of radioactive sources and health physics and associated problems in instrumentation. The successful candidate may also be required to act as Deputy to the Physicist-in-Charge. Research experience in applied nuclear physics, particularly concerning the measurement of radiation sources, would be an advantage. Reference A321/51/A.

For both posts candidates must have a first or second class honours degree in physics or Associateship of the Institute of Physics, or equivalent qualification. Salary will be assessed according to qualifications and experience within the following ranges: Principal Scientific Officer £960–£1,295 (minimum age 31) Senior Scientific Officer £720–£910 (minimum age 26); Scientific Officer £380–£620. Rates for women somewhat lower. The posts are unestablished but carry benefits under F.S.S.U. Houses will be available within a reasonable period to the successful candidates, if married. Application forms obtainable from Ministry of Labour and National Service, Technical and Scientific Register, Almack House, 26/28 King Street, London, S.W.1, quoting appropriate reference number. Closing date December 24, 1951.

Two Physicists or **Electrical/Mechanical Engineers** required for the development of automatic control installations and general process instrument work in the chemical industry in the Merseyside area. Candidates should have a first or second class honours degree and preferably some practical experience in industry or in the Armed Services. Successful candidates will be appointed to the permanent staff with membership of the Pension Fund. Excellent prospects exist for properly qualified individuals. Apply giving full particulars to Staff Manager, **Imperial Chemical Industries Limited,** General Chemicals Division, Cunard Building, Liverpool 3.

An experienced **Electrical Engineer** or **Physicist** is required by the Research Laboratories of **The General Electric Co. Ltd.,** at their Stanmore Laboratories to take responsibility for the work of a number of men engaged on research and development on circuits for the generation and handling of non-sinusoidal waveforms such as are used in timebases, differential analyzers and digital and analogue computors. Applicants preferably between 28–35 should have good honours degrees and should be able to produce evidence of ability for original work and inventiveness in the form of published work or patents. The appointment is in connection with a major guided weapon project for defence, and offers good prospects and starting salary. Applications should be sent to the Staff Manager (Ref. GBLC/197), General Electric Company Ltd., Research Laboratories, East Lane, North Wembley, Middlesex.

Electrical Engineers and **Physicists** are invited by the **Ministry of Supply** to apply for the following appointments in the Scientific Officer class at a Research and Development Establishment near London.

Senior Scientific Officer

(1) **Electrical Engineers** (2) with special qualifications in radio communications and experience in the engineering of development prototypes. Reference D390/51A.

(2) **Physicists** with experience in electronic circuits for research into the measurement of high speed transients. Reference A245/51A.

(3) **Physicist** with experience of optical and electronic techniques, and with an interest in fluid mechanics, for work on aerodynamic problems including wind tunnel investigations. Reference A246/51A.

Scientific Officer

(4) **Electrical Engineer** or **Physicist** with interest in the application of electronic methods to optical instrumentation techniques. Reference D392/51A.

(5) **Electrical Engineer** or **Physicist** for work on high speed electronic calculating machine. Reference D391/51A.

Candidates should possess a first or second class honours degree in physics or electrical engineering or equivalent qualification. For the senior grade the minimum age is 26 and at least three years' post-graduate research experience is required. For post (1) an engineering apprenticeship or industrial experience would be of advantage. Salary will be determined on age and on an assessment of the successful candidate's qualifications and experience within the ranges: Senior Scientific Officer £720–£910, Scientific Officer £380–£620. Rates for women somewhat lower. Posts are unestablished but carry benefits under F.S.S.U. Application forms obtainable from Ministry of Labour and National Service, Technical and Scientific Register (K), Almack House, 26 King Street, London, S.W1, quoting appropriate reference number. Closing date December 29, 1951.

Applications are invited by the **Ministry of Supply** for the following posts in the grade of Scientific Officer at a Design Establishment in Surrey.

(1) **Physicist** (Ref. A308/51/A) preferably with interest in statistics, to plan, supervise, and report full scale field trials, which often involve optical and electrical instrumentation, and to undertake liaison with service establishments.

(2) **Physicists** (Ref. A307/51/A) (2 posts) for general physical investigations and for work connected with fire control equipment. For one of the posts a post-graduate course in applied optics would be an advantage.

Candidates should have a first or second class honours degree. Salaries will be assessed according to age, qualifications and experience within the range £380 to £620. Rates for women somewhat lower. Posts are unestablished but carry benefits under F.S.S.U. Rented houses may be available within twelve months for the successful candidates if married. Write for application form from Ministry of Labour and National Service, Technical and Scientific Register (K), 26 King Street, London, S.W.1, quoting appropriate reference number.

Applications are invited by the **Ministry of Supply** from **physicists** for a Research Establishment in Berkshire. The work, which is of a research and development character, is concerned with the use of radioactive materials, radiation measurements and health physics. A housing site is being developed for married people and a hostel is available for single people. Salaries for these posts range from £240 to £960 and the initial salary for each candidate will depend upon age, qualifications and experience. Some of the posts call for a first or second class honours degree, preferably followed by some research experience, while for others a Higher School Certificate with physics as a principal subject is required as a minimum qualification, though higher qualifications would be an advantage. The posts are unestablished but some carry benefits under F.S.S.U.

Application forms obtainable from Ministry of Labour and National Service, Technical and Scientific Register (K), Almack House, 26 King Street, London, S.W.1, quoting reference A333/51/A. Closing date December 29, 1951.

Vacancies exist in the Mathematical Services Department of **Boulton Paul Aircraft Limited,** Wolverhampton. Applicants should possess an honours degree and the initial salary will depend on qualifications and experience. Some knowledge of one or more of the following subjects will be an asset:

Servo-mechanism theory; application of the theory of vibrations to the flutter of aircraft surfaces and components; application of the principles of fluid mechanics to problems of supersonic flow; mathematical treatment of hydraulic mechanisms; theory of electrical circuits; structural analysis, involving the use of the theory of elasticity and photoelastic technique.

Two young, but experienced, **Physicists** required by **Sir Robert Watson-Watt and Partners Limited,** scientific advisers and consultants in the fields of:

(1) Electronics, particularly in radar, radio navigation and communications;

(2) General applications of physics and light engineering in the moving picture industry and elsewhere;

(3) Operational research in industry.

Honours degree in physics, some research experience, initiative and good judgment essential. Starting salary in range £600–£700; assistance in housing offered. Written applications to 7 Gayfere Street, London, S.W.1.

UNWIN BROTHERS LIMITED, WOKING AND LONDON